

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

JIANGSU FAVORED NANOTECHNOLOGY CO., LTD.,

Petitioner

v.

P2I LTD.,

Patent Owner

Case No. IPR2024-00380
U.S. Patent No. 11,041,087

PATENT OWNER'S NOTICE OF APPEAL

Pursuant to 37 C.F.R. §§ 90.2, 90.3 and 35 U.S.C. §§ 141, 142, 143, and 319, and 37 C.F.R. §§ 90.2, 90.3, Patent Owner P2I LTD. (“Patent Owner”) hereby timely appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision of the Patent Trial and Appeal Board (the “Board”) entered on April 11, 2025 (Paper 28) and from all underlying findings, orders, decisions, rulings, and opinions that are adverse to Patent Owner. A copy of the Final Written Decision is attached as Exhibit 1.

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), Patent Owner identifies that the issues on appeal include, but are not limited to: the Board’s determination that Petitioner showed by a preponderance of the evidence that the challenged claims of US Patent 11,041,087 are unpatentable; any findings or determinations supporting or related to those issues (including the Board’s use and interpretation of the prior art and the Board’s use and interpretation of expert evidence, whether the cited reference(s) constituted non-analogous art, and whether a person of ordinary skill in the art would have been motivated to combine the references in the manner proposed); all other issues decided adversely to Patent Owner in any orders, decisions, rulings, and opinions.

Patent Owner is concurrently filing this Notice of Appeal with the Director of the United States Patent and Trademark Office and the Clerk of the United States Court of Appeals for the Federal Circuit, along with the required fees.

No fees are believed due. However, if any such fees are due, the Director is authorized to charge the fees to Deposit Account No. 60-3301.

Respectfully submitted,
BOCHNER PLLC

Dated: June 13, 2025

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CERTIFICATE OF FILING

The undersigned certifies that copies of Patent Owner's Notice of Appeal are being concurrently transmitted to:

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IPR2024-00380

Patent 11,041,087 B2

Before GRACE KARAFFA OBERMANN, AVELYN M. ROSS, and
SHELDON M. McGEE, *Administrative Patent Judges*.

McGEE, *Administrative Patent Judge*.

DECISION

Final Written Decision

Determining All Challenged Claims Unpatentable

Denying Petitioner's Motion to Strike

35 U.S.C. § 318(a)

I. INTRODUCTION

Jiangsu Favored Nanotechnology Co., Ltd. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1–5, 7, and 9–14 (the “challenged claims”) of U.S. Patent No. 11,041,087 B2 (Ex. 1001, “the ’087 patent”). P2i Ltd. (“Patent Owner”) timely filed a Preliminary Response. Paper 5 (“Prelim. Resp.”). Pursuant to our authorization (Ex. 3001), Petitioner filed a Reply to Patent Owner’s Preliminary Response (Paper 7) and Patent Owner filed a Sur-reply (Paper 8). After considering this preliminary record, we instituted this *inter partes* review as to all challenged claims. Paper 9 (“Inst. Dec.” or “DI”).

During the course of trial, Patent Owner filed a Patent Owner Response (Paper 12, “PO Resp.”); Petitioner filed a Reply to the Patent Owner Response (Paper 14, “Pet. Reply”); and Patent Owner filed a Sur-reply (Paper 17, “PO Sur-reply”). Petitioner filed the Declaration of Dr. Karen Gleason (Ex. 1002) in support of the Petition, and Patent Owner filed the Declaration of Dr. Jay Senkevich in support of its Response (Ex. 2007). The parties also filed transcripts of the depositions of Dr. Gleason (Ex. 2016) and Dr. Senkevich (Ex. 1060).

Also with Board authorization, Petitioner filed a Motion to Strike (Paper 22, “Mot. Strike”), and Patent Owner filed an Opposition to that Motion (Paper 23).

An oral hearing was held on March 26, 2025, and a transcript of the hearing is included in the record. Paper 27 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This decision is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of claims 1–5, 7, and 9–14 of the ’087 patent. For the reasons discussed *infra*,

we hold that Petitioner has demonstrated by a preponderance of the evidence that claims 1–5, 7, and 9–14 are unpatentable.

A. Real Parties-in-Interest

Petitioner identifies Jiangsu Favored Nanotechnology Co., Ltd. and Favored Tech USA Corp. as the real parties-in-interest. Pet. 63. Patent Owner identifies itself as the real party-in-interest. Paper 4, 1.

B. Related Proceedings

The parties identify a district court action as related matters: *P2i, Ltd. v. Favored Tech USA Corp.*, No. 3:23-cv-01690 (N.D. Cal). Pet. 64; Paper 4, 1.

C. The '087 patent (Ex. 1001)

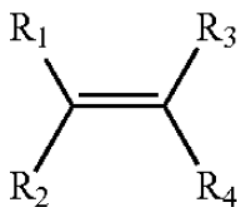
The '087 patent is entitled “Coatings” and relates to “protective coatings for electronic or electrical devices and components thereof, and methods of forming such coatings.” Ex. 1001, 1:15–17, code (54). The '087 patent discloses that the “coatings can protect by being hydrophobic and so resist the ingress of water-based liquid into electronic devices, or they can protect by forming a barrier coating and so provide electrical resistance between the electrical parts of the phone and water based liquid.” *Id.* at 1:17–22.

The '087 patent discloses that “the protective cross-linked polymeric coating is obtainable by exposing the electronic or electrical device or component thereof to a plasma comprising a monomer compound and a crosslinking reagent for a period of time sufficient to allow formation of the protective cross-linked polymeric coating on a surface thereof.” *Id.* at 2:23–28. The monomer compound and the crosslinking reagent meet certain structural requirements as discussed in more detail below. *Id.* at 4:38–13:15.

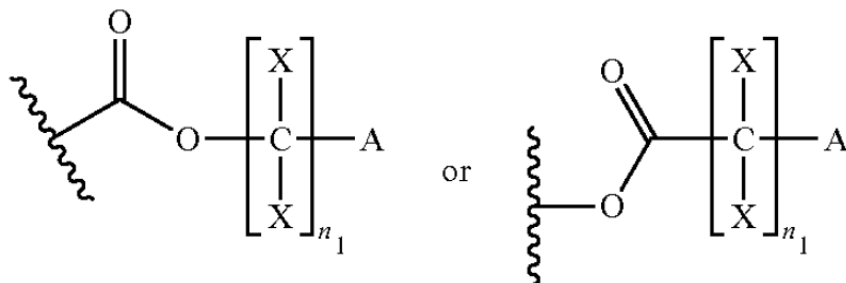
D. Illustrative Claim

Sole independent claim 1 is representative of challenged claims 1–5, 7, and 9–14 of the '087 patent, and reads:

1. An electronic or electrical device or electronic or electrical component thereof comprising a protective cross-linked polymeric coating on a surface of the device or component; wherein the protective cross-linked polymeric coating is obtained by exposing the device or component to a plasma comprising a monomer compound and a cross-linking reagent for a period of time sufficient to allow formation of the protective cross-linked polymeric coating on a surface thereof, wherein the monomer compound has the following formula:

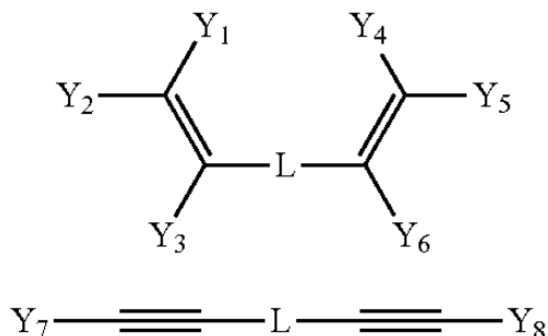


where R₁, R₂ and R₄ are each independently selected from hydrogen, optionally substituted branched or straight chain C₁-C₆ alkyl or halo alkyl or aryl optionally substituted by halo, and R₃ is selected from:



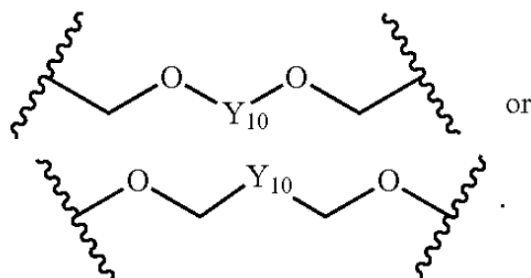
where each X is independently selected from hydrogen, a halogen, optionally substituted branched or straight chain C₁-C₆ alkyl, halo alkyl or aryl optionally substituted by halo; where A is aryl optionally substituted by halo; and n₁ is an integer from 0 to 27; and wherein the crosslinking reagent comprises two or more unsaturated bonds attached by means of one or more linker moieties and has a boiling point of less

than 500° C. at standard pressure the crosslinking reagent having one of the following structures:



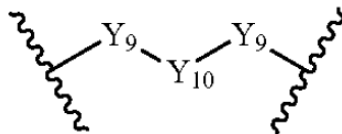
where Y₁, Y₂, Y₃, Y₄, Y₅, Y₆, Y₇ and Y₈ are each independently selected from hydrogen, optionally substituted cyclic, branched or straight chain C₁-C₆ alkyl or aryl; and L is a linker moiety;

wherein for compound (i) L is of formula A having one of the following structures:

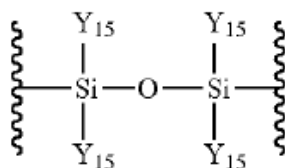


and Y₁₀ is selected from optionally substituted cyclic, branched or straight chain C₁-C₈ alkylene and a siloxane group;

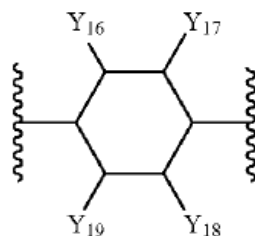
or wherein for compound (i) L is of formula B having the following formula:



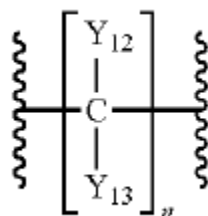
where each Y₉ is independently selected from, a bond, -O-, -O-C(O)-, -C(O)-O-, -Y₁₁-O-C(O)-, -C(O)-O-Y₁₁-, -OY₁₁-, and Y₁₁O-, where Y₁₁ is an optionally substituted cyclic, branched or straight chain C₁-C₈ alkylene; and wherein Y₁₀ has the following formula:



and each Y₁₅ is independently selected from optionally substituted branched or straight chain C₁-C₆ alkyl; or wherein Y₁₀ has the following formula:



and Y₁₆ to Y₁₉ are each independently selected from H and optionally substituted branched or straight chain C₁-C₈ alkyl or alkenyl or wherein Y₁₀ has the following formula:



and each Y₁₂ is fluoro and each Y₁₃ is fluoro, and n is an integer from 1 to 10.

Ex. 1001, 18:25–20:11.

E. Instituted Grounds of Unpatentability

Claims Challenged	Statutory Basis	Reference(s)
1–3, 5, 7, 9–14	§ 103	Cohen ¹ , Legein ²
1–4, 7, 9–14	§ 103	Francesch ³ , Legein

¹ US 2,716,638, issued August 30, 1955 (Ex. 1004).

² WO 2014/026967 A2, published February 20, 2014 (Ex. 1005).

³ “Fabrication of Bioactive Surfaces by Plasma Polymerization Techniques

II. ANALYSIS

A. *Level of Ordinary Skill in the Art*

The level of ordinary skill in the art at the time of invention is an issue of fact that serves as “a prism or lens through which a judge or jury views the prior art and the claimed invention” and which “supplies the primary guarantee of objectivity in” the obviousness analysis. *Al-Site Corp. v. VSI Intern., Inc.*, 174 F.3d 1308, 1324 (Fed. Cir. 1999) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991)).

The parties agree that a person of ordinary skill in the art in the field of the '087 patent in June 2015⁴ “would have had at least a bachelor’s degree in a field such as chemistry, physics, or chemical engineering, as well as at least two years of experience with plasma-polymerization techniques.” Pet. 20 (citing Ex. 1002 ¶¶ 22–29); PO Resp. 13 (Patent Owner stating that it “does not dispute this characterization of the level of ordinary skill in the art.”); *see also* PO Sur-reply 1–2 (noting both parties’ agreement on the education and experience level of the ordinarily skilled artisan).

That agreed-upon definition is consistent with the disclosures in the '087 patent, certain prior art references filed in this proceeding, as well as the declaration testimony of Dr. Gleason. *See* Ex. 1001, 14:3–7 (identifying and incorporating by reference patent applications that disclose known methods of delivering a monomer and/or crosslinker into a plasma chamber via aerosolization); 14:26–36 (disclosing what the skilled artisan would have

Using a Novel Acrylate-Derived Monomer,” *Plasma Processes and Polymers*, 2005, 2, 605–611 (Ex. 1006).

⁴ The '087 patent’s earliest priority date is June 9, 2015. Ex. 1001, code (30).

understood about varying the amounts of crosslinking reagent and the resultant impact on the type of coating, the coating's stability, and its highest water contact angle); 14:66–15:5 (disclosing that “the precise conditions under which the protective polymeric coating is formed in an effective manner will vary” and that such “conditions can be determined using routine methods”); Ex. 1039, 28 (disclosing that plasma polymerization with the crosslinking reagent divinyltetramethyldisiloxane (DVTMDS) was known in 1994); Ex. 1002 ¶¶ 23–29 (setting forth the state of the art as of June 2015 and testifying as to the education and work experience of a person of ordinary skill in this art).

Because the level of ordinary skill in the art is not in dispute, and because the undisputed definition of that level is consistent with the disclosures in the '087 patent, the prior art, and the declaration testimony of Dr. Gleason, we view the prior art and arguments through this lens when determining whether the claims are unpatentable as obvious over the prior art.⁵ *See Graham*, 383 U.S. at 17 (identifying “the level of ordinary skill in the pertinent art” as an underlying factual inquiry to be resolved in deciding obviousness, which is a question of law).

B. Claim Construction

We apply the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b). 37 C.F.R. § 42.100(b). Under that standard, claim terms “are generally given their ordinary and customary meaning” as understood by a person of ordinary

⁵ This is the same unopposed definition we applied in our Decision on Institution. DI 7.

skill in the art at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc). “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

On the fully developed trial record, we determine that no claims need an express construction. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (holding that only claim terms in controversy need to be construed, and only to the extent necessary to resolve the controversy (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

C. Relevant Principles of Law

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) where in evidence, so-called secondary considerations.⁶ *Graham*, 383 U.S. at 17–18.

⁶ The parties do not present arguments or evidence related to such secondary considerations. Therefore, secondary considerations do not constitute part of

Additionally, the obviousness inquiry typically requires an analysis of “whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”)); see *Innogenetics, N.V. v. Abbott Labs.*, 512 F.3d 1363, 1374 (Fed. Cir. 2008) (agreeing with the district court’s holding that “some kind of motivation must be shown from some source, so that the [trier of fact] can understand why a person of ordinary skill would have thought of either combining two or more references or modifying one to achieve the patented [invention]”)).

“Whether prior art invalidates a patent claim as obvious is determined from the perspective of one of ordinary skill in the art.” *Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 655 F.3d 1364, 1374 (Fed. Cir. 2011). Further, “the assessment of a claim’s patentability is inextricably tied to a skilled artisan’s knowledge and skill level.” *Qualcomm Inc. v. Apple Inc.*, 24 F.4th 1367, 1376 (Fed. Cir. 2022).

We analyze whether the challenged claims would have been obvious with these principles in mind.

D. Assessment of the Patentability Challenges

We begin our assessment of the challenges with an overview of the asserted prior art references. We then turn to Petitioner’s asserted grounds of unpatentability and the persuasiveness of Petitioner’s arguments and

our analysis in this Decision.

evidence. We then address Patent Owner’s arguments against each of Petitioner’s challenges.

1. *Cohen (Ex. 1004)*

Cohen discloses preparing crosslinked polymers by copolymerizing an organosilane crosslinking reagent such as divinyltetramethyldisiloxane (“DVTMDS”) with a monomeric compound such as benzyl acrylate and benzyl methacrylate. Ex. 1004, 4:6–39. Cohen discloses that its crosslinked polymers can be used in a variety of electrical applications, and that the polymerization can be generated *in situ*. *Id.* at 5:1–25.

2. *Legein (Ex. 1005)*

Legein discloses “a method of coating a component and/or a device to protect the component and/or the device from corrosion and liquid damage whilst affording electrical conductivity to the coated component and/or the coated device.” Ex. 1005, 4:22–24. Legein discusses “the method comprising providing on the component and/or the device a layer of a protective polymer species formed from any one or more of the following precursor monomers: acrylate; methacrylate; or organosilane.” *Id.* at 4:24–5:2. “Preferably, the method comprises the step of depositing the precursor monomer by means of low power and/or low pressure plasma polymerization.” *Id.* at 6:10–11.

3. *Francesch (Ex. 1006)*

Francesch describes a study “to develop a feasible alternative to complex functionalized monomers” and the subsequent synthesis of a “new acrylate-type monomer, pentafluorophenyl methacrylate (PFM) . . . for plasma polymerization.” Ex. 1006, 606. Francesch discloses plasma

polymerization of monomers PFM and 1,4-butanediol divinyl ether (“BDVE”), where the “polymers were deposited on 100 oriented silicon wafers” and “[a]ll polymerizations were performed under pulsed plasma.” *Id.* at 607.

4. *Alleged Obviousness over Cohen and Legein*

Petitioner contends that the subject matter of claims 1–3, 5, 7, and 9–14 would have been obvious over the disclosures of Cohen and Legein. Pet. 24–45. Petitioner identifies with particularity disclosures in these prior art references that teach or suggest each feature of the challenged claims. *Id.* Petitioner also provides well-supported reasons why a person of ordinary skill in the art would have been motivated to combine the teachings of the applied prior art to arrive at the claimed subject matter with a reasonable expectation of success. *Id.* at 31–37.

For example, regarding sole independent claim 1, Petitioner persuasively shows that Cohen discloses preparing crosslinked polymers by copolymerizing an acrylate or methacrylate monomer with an organosilane crosslinking reagent, and that such crosslinked polymers could be used to protect electrical devices. Pet. 25; Ex. 1004, 3:52–65, 5:1–25. Petitioner persuasively argues that Cohen discloses two species of monomer—i.e., benzyl acrylate and benzyl methacrylate—and convincingly shows how each species falls within the scope of the generic monomer structure recited in claim 1. Pet. 26–27; Ex. 1004, 4:38–39. Petitioner also persuasively argues that Cohen discloses the organosilane crosslinking reagent species divinyltetramethyldisiloxane (DVTMDS) and convincingly shows how DVTMDS both falls within the scope of the generic crosslinking reagent

structure recited in claim 1 and has a boiling point of less than 500°C.

Pet. 28–31; Ex. 1004, 3:38–45, 4:6–7; Ex. 1054 ¶ 4.

Petitioner also persuasively demonstrates that Legein describes using plasma polymerization techniques to apply protective polymeric coatings to electrical devices and components, and teaches that such coatings could be made from one or more of acrylate, methacrylate, and organosilane precursor molecules. Pet. 25–26; Ex. 1005, 1:3–7, 4:5–7, 22–5:5, 6:10–11, 8:14–17, 20:12–21.

Petitioner furthermore provides no fewer than seven reasons that a person of ordinary skill in the art would have been motivated to arrive at the claimed subject matter with a reasonable expectation of success (Pet. 31–37), and provides ample persuasive evidence to support its positions. Ex. 1002 ¶¶ 32–61, 78–82, 136–193. For example, Petitioner asserts that a person of ordinary skill in the art would have known that Legein preferred acrylate and methacrylate monomers together with organosilanes for applying protective coatings on electronics, and would have known that DVTMDS is one such organosilane. Pet. 33. Petitioner sets forth why a person of ordinary skill in the art would have been motivated to choose a non-halogenated compound such as benzyl acrylate or benzyl methacrylate from the other monomer species disclosed by Cohen to prepare a crosslinked polymer via plasma polymerization using Legein’s process. *Id.* at 32–34. Petitioner explains in detail how a person of ordinary skill in the art would have had a reasonable expectation of successfully arriving at the claimed subject matter. *Id.* at 36–37.

In essence, Petitioner persuasively demonstrates that Cohen discloses each of the claimed limitations but for the requirement that the coating be

obtained by exposing the electronic device being coated to a *plasma* comprising a monomer compound and a crosslinking reagent. Petitioner relies on Legein for its disclosure of well-known plasma polymerization techniques used with various electronic devices, and persuasively provides a multitude of reasons why a person of ordinary skill in this art in June 2015 would have been motivated to employ plasma polymerization techniques with a reasonable expectation of successfully arriving at the subject matter of claim 1.

Patent Owner does not contest the majority of Petitioner's positions regarding this challenge. Rather, Patent Owner advances two main arguments: 1) that Cohen is non-analogous art, and 2) a person of ordinary skill in the art would not have been motivated to combine Cohen and Legein. PO Resp. 17–27. We address each of these arguments below.

a) Non-analogous art

Patent Owner's argument that Cohen is non-analogous art is not well-taken. PO Resp. 17–22.

Two criteria have evolved for determining whether prior art is analogous: (1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved.

In re Clay, 966 F.2d 656, 658–59 (Fed. Cir. 1992).

Patent Owner addresses each of these prongs. PO Resp. 17–22. First, Patent Owner argues that the '087 patent's field of endeavor is limited to “plasma polymerized protective coatings for electronic devices,” which, according to Patent Owner is confirmed by the specification and the claims. *Id.* at 18.

We disagree with Patent Owner. Although the claims of the '087 patent recite obtaining the protective cross-linked polymeric coating “by exposing the device or component to a plasma,” the field of endeavor analysis in an analogous art inquiry does not exclusively turn on the claims at issue, but rather takes account of the entirety of a patent’s disclosure. *See In re Bigio*, 381 F.3d 1320, 1326 (Fed. Cir. 2004) (explaining that “the PTO must show adequate support for its findings on the scope of the field of endeavor *in the application’s written description and claims*” (emphasis added)); *In re Mettke*, 570 F.3d 1356, 1359 (Fed. Cir. 2009) (rejecting an argument that the field of endeavor was limited to a claimed “Internet terminal” when “the specification describes various communication media, including facsimile machines and email, as related to the invention.”). This is significant here because the '087 patent discloses that “[t]he ... invention relates to protective coatings” and specifically “relates to protective coatings for electronic or electrical devices and components thereof, and methods of forming such coatings.” Ex. 1001, 1:14–17. Based on this disclosure, we find that the '087 patent’s field of endeavor relates to “protective coatings for electronic or electrical devices and components thereof” broadly, not just those formed on such devices or components via a plasma polymerization process as asserted by Patent Owner. *Id.*

Although Cohen does not explicitly disclose that its crosslinked polymers constitute a “protective coating,” Cohen does disclose that its “copolymerizable mixture can be cast into films” (Ex. 1004, 2:61–62), that the polymerization can “effected in situ,” and that the polymers may be used in “numerous” electrical applications (*id.* at 5:17–25). Tr. 8:9–10:2, 27:2–21; *see* Pet. Reply 5 (explaining how “Cohen described insulating polymers

that could be applied as films and be used to protect substrates including cables and electrical coils.” (citing Ex. 1004, 2:60–63, 5:13–25)). These disclosures suggest strongly that Cohen’s crosslinked polymers—if cast into a film or formed *in situ* on an electrical device or component—would serve as a protective coating on that electrical device or component, even though Cohen does not expressly refer to its crosslinked polymers *ipsis verbis* as a “protective coating.” Thus, we find that Cohen is within the field of endeavor of the ’087 patent.

Cohen is also reasonably pertinent to the problems with which the inventors of the ’087 patent were involved. *Clay*, 966 F.2d at 658–59. Here, we disagree with Patent Owner’s assertion that the problems with which the inventors of the ’087 patent were involved are limited to those “specific to plasma polymerization” or “plasma polymerized protective coatings for electronic devices.” PO Resp. 19–20. As Petitioner correctly argues (Pet. Reply 8–9), Patent Owner has framed both the field of endeavor and the purported problems facing the ’087 patent inventors using the same exact terminology—“Plasma Polymerized Protective Coatings for Electronic Devices.” PO Resp. 18, 19. That approach is legally erroneous because it “effectively collapses the field-of-endeavor and reasonable-pertinence inquiries and ignores that the reasonable-pertinence analysis must be carried out through the lens of a [person having ordinary skill in the art] who is considering turning to art *outside* her field of endeavor.” *Donner Tech., LLC v. Pro Stage Gear, LLC*, 979 F.3d 1353, 1360 (Fed. Cir. 2020) (emphasis added).

A preponderance of evidence supports Petitioner’s position that the inventors of the ’087 patent were concerned about more than just problems

associated with plasma polymerized coatings for electronic devices.

Pet. Reply 6–7. As Dr. Gleason persuasively testifies, at the time of the invention, “[t]he degree of crosslinking was known to affect the mechanical properties and wetting behaviors of polymer films.” Ex. 1002 ¶ 54 (citing Ex. 1026, 6552–53; Ex. 1008 ¶¶ 20, 46). And the intrinsic record makes plain that the inventors of the ’087 patent were focused on the degree of a given polymer’s crosslinking, noting that “[h]igh levels of polymer crosslinking (formerly only achievable with high average power continuous wave plasmas) can be achieved by adding a crosslinking molecule to the monomer to produce a cross-linked co-polymer.” Ex. 1001, 2:57–60; *see also id.* at 1:67–2:1 (noting how the degree of crosslinking impacts a polymer’s resistance to smearing). As Petitioner persuasively points out, “the ’087 patent explains that the inventors sought polymers that could protect electronic devices and would also remain stable and in place once applied—for example, without smearing—due to sufficient crosslinking.” Pet. Reply 6–7 (citing Ex. 1001, 1:17–22, 1:29–42, 1:66–2:4, 2:64–3:3, 14:34–36; Ex. 1002 ¶¶ 50–54).

Against that backdrop, we find that Cohen is reasonably pertinent to the problem of forming sufficiently crosslinked polymers because it “described known materials that could be used effectively to create protective, *crosslinked* polymer coatings” having a wide variety of applications including crosslinked polymer coatings for electrical applications. Pet. Reply 7 (emphasis in original); Ex. 1004, 2:14–30, 4:38–57, 5:1–2, 17–25; *see id.* at 3:52–64 (discussing how the degree of crosslinking achieved using DVTMDS as crosslinker with methyl methacrylate impacted certain properties).

In sum, we are not persuaded by Patent Owner's arguments that Cohen is non-analogous art.

b) Motivation to Combine and Reasonable Expectation of Success

We are also not persuaded by Patent Owner's assertion that a person of ordinary skill in the art would not have been motivated to combine the teachings of Cohen and Legein. PO Resp. 25–26. Notably, Patent Owner only addresses one of the myriad reasons Petitioner provides to support why a person of ordinary skill would have been motivated to combine the prior art in the manner claimed. *Compare* PO Resp. 25–26 (discussing Petitioner's argument at page 35 of the Petition regarding how plasma polymerization is a dry process), *with* Pet. 31–35 (setting forth at least six additional reasons why a person of ordinary skill in the art would have been motivated to combine the references in the manner claimed). Patent Owner's motivation to combine argument is therefore facially deficient because it does not challenge the full scope of reasons Petitioner provides. Petitioner's reasons for the combination, which stand unopposed on this record, fully support the challenge. Pet. 31–35.

Nor do we agree with Patent Owner's assertion that “the type of plasma polymerization *required to meet* the claimed ‘protective cross-linked polymeric coating’ (limitation 1[a]) would be pulsed plasma polymerization, with specific optimized parameters.” PO Resp. 25 (citing Ex. 2007 ¶ 101 (emphasis added)). The evidence Patent Owner cites in support of this assertion does not say that pulsed plasma polymerization is the only method by which the protective coating required by claim 1 (and thus all challenged claims) may be generated. Rather, the testimonial evidence cited by Patent Owner merely provides Dr. Senkevitch's opinion that plasma polymerization

was routine in June 2015 and that pulsed plasma polymerization was not. Ex. 2007 ¶ 101. Thus, Patent Owner fails to provide adequate support for its assertion that pulsed⁷ plasma polymerization, with certain “specific optimized parameters”⁸ is required to arrive at the coating recited in claim 1. “Attorneys’ argument is no substitute for evidence.” *Johnston v. IVAC Corp.*, 885 F.2d 1574, 1581 (Fed. Cir. 1989).

Finally, we find little merit in Patent Owner’s attempts to undermine the capabilities of the ordinarily skilled artisan in this art. *See* PO Resp. 13, 25–27 (repeatedly disparaging what a person of ordinary skill in the art would have been capable of doing). Although the parties agree on the ordinarily skilled artisan’s level of education and experience, Patent Owner and its expert Dr. Senkevich repeatedly make inconsistent statements regarding the qualifications of the person of ordinary skill in the art. Namely, Patent Owner first agrees with Petitioner’s proffered definition of a person of ordinary skill as having “*at least* a bachelor’s degree in a field such as chemistry, physics, or chemical engineering, as well as *at least* two years of experience with plasma-polymerization techniques.” Pet. 20 (emphases added); *compare id.* (setting forth this standard), *with* PO Resp. 13 (stating that “Patent Owner does not dispute this characterization of the level of ordinary skill in the art”). This undisputed level of ordinary skill would include educational levels higher than a bachelor’s degree (e.g., a

⁷ Even if Patent Owner’s argument was supported by evidence, pulsed plasma polymerization to apply a polymeric coating on electronic devices is taught by Legein. Ex. 1005, 8:14–17, 9:12–13.

⁸ Patent Owner provides no detail as to what those specific optimized parameters are.

Master's degree) and more than two years (e.g., four years) of experience in plasma-polymerization techniques by virtue of the phrase "at least" in the parties' agreed-upon definition.

Patent Owner and Dr. Senkevitch then confusingly represent that a person of ordinary skill in the art would "*only* have a bachelor's degree and two years of" experience in the relevant field. PO Resp. 13 (emphasis added); *see* PO Sur-reply 1; Ex. 2007 ¶¶ 33, 103 (repeating this incorrect definition); *id.* ¶ 52 (testifying that "[a]n advanced degree in these fields may be substituted for professional experience and vice-versa" when no such substitution was proffered by Petitioner); *see also id.* ¶ 77 (testifying that "the variability in PECVD methods and parameters are simply too great, and the process simply too unpredictable to allow a POSITA with *merely* a bachelor's degree in the relevant field to apply Cohen and stumble upon the claimed invention." (emphasis added)).

Because of Patent Owner's shifting definitions of the education and experience level of the ordinarily skilled artisan, it is unclear on the complete record what precise definition Patent Owner and Dr. Senkevitch are applying when arguing the skilled artisan's capabilities. PO Resp. 13, 22–27, 31–32, 34–40; PO Sur-reply 1–6, 11–13; Ex. 2007 ¶¶ 30, 31, 33, 34, 37, 40, 52–55, 60, 68, 74, 76, 77, 80–86, 89, 91, 94, 95, 100, 102–105, 108, 110, 111, 113–116, 118–120, 122, 124, 127–134. We, therefore, give Dr. Senkevitch's testimony regarding the capabilities of a person of ordinary skill in the art minimal weight, which leaves us with Patent Owner's insufficiently supported arguments regarding the skilled artisan's capabilities. PO Resp. 13, 22–27, 31–32, 34–40; PO Sur-reply 1–6, 11–13.

Moreover, as Petitioner correctly points out, the '087 patent expressly teaches that the precise conditions for forming a protective polymeric coating “will vary depending upon factors such as, without limitation, the nature of the monomer compound, the crosslinking agent, the substrate, as well as the desired properties of the coating” and that such “conditions can be determined *using routine methods*.” Ex. 1001 15:1–15:5 (emphasis added); Pet. Reply 17. Where the patent itself leaves to the judgment of an ordinarily skilled artisan the assessment of these factors to ascertain suitable conditions for forming the protective coating, we find persuasive Petitioner’s view that it would have been well within the level of ordinary skill to ascertain such suitable conditions.

With respect to the amount of crosslinking reagent,⁹ the '087 patent also teaches that

[t]he skilled person would understand that the amount will vary to some extent depending on whether the coating is required to be liquid repellent or provide a barrier to mass and electron transport. The skilled person would understand that the (v/v) percentages [disclosed earlier in the paragraph for crosslinking reagents] are those which give a stable crosslinked polymer coating and the highest water contact angle.

Ex. 1001, 14:30–36.

These disclosures constitute strong intrinsic evidence that a person of ordinary skill in the art would not have needed any special knowledge to be capable of carrying out the claimed invention as suggested by Patent

⁹ Patent Owner specifically attempts to cast doubt on the ability of a person of ordinary skill in the art to discern the amount of crosslinking reagent to use. PO Resp. 26, 36, 37, 39–40.

Owner's argument. PO Resp. 25–26. Indeed, if any special knowledge was needed to make or use the claimed device or component beyond what is disclosed in the '087 patent, our enablement statute would require such disclosure. *See* 35 U.S.C. § 112(a) (requiring that a “specification *shall contain* a written description of the invention, and of the manner and process of *making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art* to which it pertains . . . to make and use the same” (emphases added)).

Thus, despite its assertions that making the claimed cross-linked polymeric coating would be an “extensive trial-and-error process with many unknown variables and a large amount of unpredictability as to the properties of the resulting coating” and that “such a process would be wholly outside the capabilities of a POSITA,” (PO Resp. 26), Patent Owner points to nothing in the '087 patent specification that constitutes the “full, clear, concise, and exact terms” required by law that would enable the skilled artisan to make and use the claimed subject matter. Put simply, Patent Owner's suggestion that some special, undisclosed knowledge would have been required to practice the '087 patent claims is incompatible with the rules surrounding enablement and, more importantly for our purposes, appears on this record to be an unconvincing attempt to hold the prior art to a higher level of disclosure than the challenged patent. Pet. Reply 17 (“If POSAs were as incapable as [Patent Owner] and Dr. Senkevich suggest, they would be unable to make the claimed coating given the '087 patent's own limited guidance.”); *see In re Epstein*, 32 F.3d 1559, 1568 (Fed. Cir. 1994) (“[T]he Board's observation that appellant did not provide the type of detail in his specification that he now argues is necessary in prior art

references supports the Board’s finding that one skilled in the art would have known how to implement the features of the references.”). We, therefore, reject Patent Owner’s *de facto* attempt to hold Cohen and Legein to a higher standard of disclosure than that of the ’087 patent.

Moreover, Dr. Gleason persuasively testifies that plasma polymerization was well known to persons of ordinary skill in the art at earliest priority date of the ’087 patent, i.e., June 9, 2015, and that “[t]he plasma deposition equipment and techniques described in the ’087 patent would have been considered conventional in the field by June 2015.” Ex. 1002 ¶ 27; *see* Ex. 1063,¹⁰ code (57), 4:1–2 (disclosing generating a coating on a substrate such as a semiconductor using a plasma deposition process); Ex. 1064,¹¹ code (57); 1:13–15, 6:16–17 (same).

This evidence—uncontested by Patent Owner—establishes that a person of ordinary skill in the art would have had the capability of modifying the prior art in the manner set forth in the Petition to arrive at the claimed subject matter.

We emphasize here that we do not rely on the contested evidence of record pertaining to the capabilities of five graduate-level students at the Massachusetts Institute of Technology (MIT).¹² Ex. 1059 ¶ 13;

¹⁰ This reference is WO2003/101612A1, published December 11, 2003, which is incorporated by reference in the ’087 patent. Ex. 1001, 14:3–7.

¹¹ This reference is WO2003/097245A1, published November 27, 2003, which is incorporated by reference in the ’087 patent. Ex. 1001, 14:3–7.

¹² Patent Owner’s rebuttal evidence on this point (Exs. 2015 ¶¶ 7–16, 2017, and 2018) is the subject of Petitioner’s Motion to Strike. Mot. Strike, *generally*. Because we do not rely on any of the disputed evidence in our determination of the capabilities of a person of ordinary skill in the art, we

Pet. Reply 16–17. These individuals do not meet the parties’ agreed-upon definition of a person of ordinary skill in the art because none had any experience with plasma-polymerization techniques. *Compare* Pet. 20 (setting forth the undisputed definition of a person of ordinary skill in the art as requiring “at least a bachelor’s degree” in certain fields “as well as at least two years of experience with plasma-polymerization techniques”), *with* Ex. 1059 ¶ 13 (Dr. Gleason testifying that each of the graduate students “had a bachelor’s degree in chemical engineering and *no prior experience* with plasmas” (emphasis added)). Additionally, in an obviousness analysis, the capabilities of a person of ordinary skill in the art cannot be tied to one specific individual (or a group of five individuals) advised by Dr. Gleason at MIT. Rather, the person of ordinary skill in the art is a “hypothetical person” and an “imaginary being . . . created by Congress to provide a *standard of patentability*.” *Kimberly-Clark Corp. v. Johnson & Johnson*, 745 F.2d 1437, 1454 (Fed. Cir. 1984) (emphasis in original).

c) Conclusion regarding Ground 1

Petitioner persuasively demonstrates that Cohen and Legein disclose each element of the challenged claims, and that a person of ordinary skill in the art would have been motivated to combine the teachings of these references with a reasonable expectation of success. Pet. 24–45. Petitioner provides persuasive evidence and Declaration testimony to support its challenge. Ex. 1002 ¶¶ 32–61, 78–82, 136–193.

We conclude that Petitioner has shown by a preponderance of the evidence that claims 1–3, 5, 7, and 9–14 would have been obvious over the

deny Petitioner’s Motion to Strike as moot. *See infra*, Section III.

combined teachings of Cohen and Legein.

5. *Alleged Obviousness over Francesch and Legein*

Petitioner contends that the subject matter of claims 1–4, 7, and 9–14 would have been obvious over the disclosures of Francesch and Legein. Pet. 46–60. Petitioner identifies with particularity disclosures in these prior art references that teach or suggest each feature of the challenged claims. *Id.* Petitioner also provides well-supported reasons why a person of ordinary skill in the art would have been motivated to combine the teachings of the applied prior art to arrive at the claimed subject matter with a reasonable expectation of success. *Id.* at 52–55.

For example, regarding sole independent claim 1, Petitioner persuasively shows that Francesch discloses a plasma polymerization process to apply a crosslinked polymer to 100 silicon wafers using the aryl acrylate monomer pentafluorophenyl methacrylate (PFM) and the crosslinker 1, 4-butanediol divinyl ether (BVDE). Pet. 47; Ex. 1006, 606–607. Petitioner persuasively argues that Francesch’s monomer species PFM falls within the scope of the generic monomer structure recited in claim 1 and that Francesch’s crosslinking reagent species BVDE both falls within the scope of the generic crosslinking reagent structure recited in claim 1 and has a boiling point of less than 500°C. Pet. 47–50; Ex. 1006, 606–609; Ex. 1002 ¶¶ 204–05.

Petitioner also persuasively points out how Legein describes using plasma polymerization techniques to apply protective polymeric coatings to electrical devices and components. Pet. 46, 47; Ex. 1005, 4:22–26, 6:10–11.

Petitioner also provides no fewer than five reasons that a person of ordinary skill in the art would have been motivated to arrive at the claimed

subject matter with a reasonable expectation of success (Pet. 52–55), and provides persuasive evidence to support its positions. Ex. 1002 ¶¶ 32–76, 82–85, 194–230.

Patent Owner does not contest the majority of Petitioner’s positions regarding this challenge. Rather, Patent Owner makes substantially similar arguments against this challenge as those unpersuasively advanced for the patentability challenge based on Cohen and Legein. PO Resp. 27–41. We find those arguments unpersuasive here for substantially the same reasons we provided *supra* in Section II.D.4. We add the following analysis as it pertains to this specific challenge.

a) Non-analogous art

Patent Owner asserts that Francesch is non-analogous art to the ’087 patent. We disagree.

As set forth *supra* in Section II.D.4.a., the field of endeavor of the ’087 patent relates to “protective coatings for electronic or electrical devices and components thereof” broadly, not just those formed on such devices or components via a plasma polymerization process as asserted by Patent Owner. *Compare* PO Resp. 28, *with* Ex. 1001, 1:14–17 (setting forth the “Field of Invention” with no mention of plasma polymerization).

As aptly pointed out by Petitioner and Dr. Gleason, Francesch discloses polymer coatings applied to silicon wafers, which is a common substrate found in many electronics (Ex. 1002 ¶ 208) and is the same substrate upon which polymer coatings were applied in multiple examples of the ’087 patent. Pet. Reply 6; Ex. 1001, 15:54–55, 16:66. Thus, we find that Francesch is in the same field of endeavor as the ’087 patent.

Moreover, Francesch is reasonably pertinent to the problems with which the inventors of the '087 patent were involved. Again, as Petitioner explains, “the '087 patent explains that the inventors sought polymers that could protect electronic devices and would also remain stable and in place once applied—for example, without smearing—due to sufficient crosslinking.” Pet. Reply 6–7 (citing Ex. 1001, 1:17–22, 1:29–42, 1:66–2:4, 2:64–3:3, 14:34–36; Ex. 1002 ¶¶ 50–54). Francesch is reasonably pertinent to that problem because it “described known materials that could be used effectively to create protective, *crosslinked* polymer coatings” (Pet. Reply 7) such as PFM and BDVE, and applying such coatings to a silicon wafer—the same substrate used in Examples 1 and 3 of the '087 patent. Ex. 1001, 15:53–44, 16:66–67.

Thus, Francesch is analogous art to the '087 patent.

b) Motivation to Combine

Patent Owner asserts that a person of ordinary skill in the art would not have been motivated to combine the teachings of Francesch with those of Legein because “Francesch does not disclose why adding a crosslinking reagent provides any benefit to the coating.” PO Resp. 35. We find this argument unpersuasive because it is both technically erroneous and also does not address the full scope of the evidence relied on in Petitioner’s challenge.

As Petitioner and Dr. Gleason point out, Francesch discloses that crosslinking “improve[d] the solvent resistance of the resulting deposited thin films.” Pet. 53; Ex. 1006, 610; Ex. 1002 ¶ 209; *see also id.* ¶¶ 50–54 (Dr. Gleason testifying to the breadth of knowledge regarding crosslinking and its benefits at the time of the invention). Patent Owner does not address

Petitioner’s persuasive evidence regarding the knowledge of a person of ordinary skill in the art sufficiently. Rather, similar to the other challenge, Patent Owner attempts unsuccessfully to undermine the capabilities of the skilled artisan. PO Resp. 36 (nakedly asserting the skilled artisan “in 2015 would not know how to optimize” certain parameters to create the claimed polymeric coating); *id.* at 37 (asserting the skilled artisan would not know how to modify certain reaction conditions and “would be overwhelmed by the numerous parameters . . . the complexity and unpredictability of the pulsed plasma polymerization technique, and the lack of any teaching, suggestion, or motivation in Legein or Francesch”); *id.* at 39–40 (asserting that there are many parameters affecting a “wide variety of plasma polymerization techniques” and asserting no reasonable expectation of successfully combining the references, in part, due to the skilled artisan’s lack of knowledge on how to optimize certain unmentioned parameters).

We again accord minimal weight to Dr. Senkevitch’s testimony regarding the capabilities of the ordinarily skilled artisan (Ex. 2007 ¶ 94) because it is unclear on the complete record what definition Dr. Senkevitch is applying when arguing the skilled artisan’s capabilities. *See, supra* at Section II.D.4.b. (identifying Patent Owner’s and Dr. Senkevitch’s changing definitions of a person of ordinary skill in the art throughout the briefing and proffered testimonial evidence). Similarly, as with Petitioner’s challenge based on Cohen and Legein, Patent Owner is again holding the prior art to a higher standard than the disclosure of the ’087 patent itself, which is improper. *Epstein*, 32 F.3d at 1568.

c) Conclusion regarding Ground 2

Petitioner persuasively demonstrates that Francesch and Legein

disclose each element of the challenged claims, and that a person of ordinary skill in the art would have been motivated to combine the teachings of these references with a reasonable expectation of success. Pet. 46–60. Petitioner provides persuasive evidence and Declaration testimony to support its challenge. Ex. 1002 ¶¶ 32–76, 82–85, 194–230.

We conclude that Petitioner has shown by a preponderance of the evidence that claims 1–4, 7, and 9–14 would have been obvious over the combined teachings of Francesch and Legein.

III. MOTION TO STRIKE

Petitioner’s Motion to Strike is denied as moot because our Decision does not rely on the contested evidence, i.e., Exhibits 2015, 2017, and 2018.

IV. CONCLUSION

Petitioner has shown by a preponderance of the evidence that the challenged claims are unpatentable as summarized below:

Claims	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–3, 5, 7, 9–14	§ 103	Cohen, Legein	1–3, 5, 7, 9– 14	
1–4, 7, 9– 14	§ 103	Francesch, Legein	1–4, 7, 9–14	
Overall Outcome			1–5, 7, 9–14	

V. ORDER

In consideration of the foregoing, it is
ORDERED that Petitioner has shown that claims 1–5, 7, and 9–14 of
the '087 patent are unpatentable; and

FURTHER ORDERED that the Motion to Strike is denied.

FURTHER ORDERED that because this is a Final Written Decision,
parties to this proceeding seeking judicial review of our decision must
comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2024-00380
Patent 11,041,087 B2

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